

THYRISTOR MODULE

PK(PD,PE,KK)160F

TOP



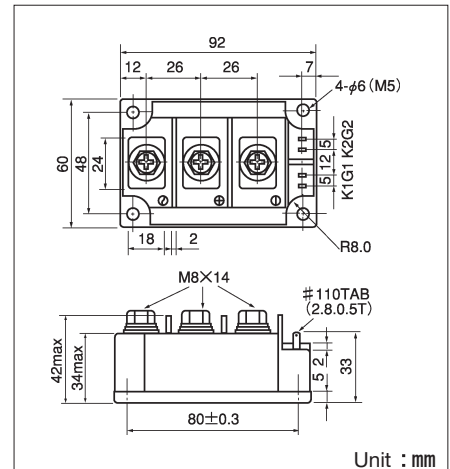
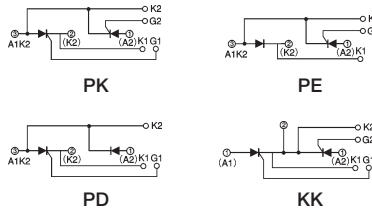
UL:E76102 (M)

Power Thyristor/Diode Module **PK160F** series are designed for various rectifier circuits and power controls. For your circuit application, following internal connections and wide voltage ratings up to 1,600V are available. Two elements in a package and electrically isolated mounting base make your mechanical design easy.

- $I_{T(AV)}$ 160A, $I_{T(RMS)}$ 250A, I_{TSM} 5500A
- di/dt 200 A/ μ s
- dv/dt 500V/ μ s

(Applications)

Various rectifiers
AC/DC motor drives
Heater controls
Light dimmers
Static switches



Maximum Ratings

Symbol	Item	Ratings				Unit
		PK160F40 PD160F40 PE160F40 KK160F40	PK160F80 PD160F80 PE160F80 KK160F80	PK160F120 PD160F120 PE160F120 KK160F120	PK160F160 PD160F160 PE160F160 KK160F160	
VRRM	*Repetitive Peak Reverse Voltage	400	800	1200	1600	V
VRSM	*Non-Repetitive Peak Reverse Voltage	480	960	1300	1700	V
VDRM	Repetitive Peak Off-State Voltage	400	800	1200	1600	V

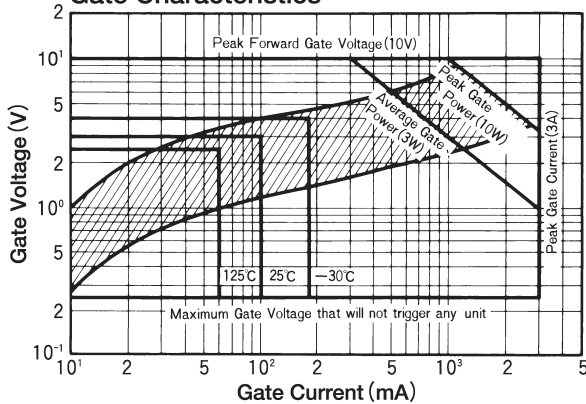
Symbol	Item		Conditions	Ratings	Unit
$I_{T(AV)}, I_{F(AV)}$	*Average On-State Current		Single phase, half wave, 180° conduction, $T_c : 87^{\circ}\text{C}$	160	A
$I_{T(RMS)}, I_{F(RMS)}$	*R.M.S. On-State Current		Single phase, half wave, 180° conduction, $T_c : 87^{\circ}\text{C}$	250	A
I_{TSM}, I_{FSM}	*Surge On-State Current		$\frac{1}{2}$ cycle, 50Hz/60Hz, peak Value, non-repetitive	5000/5500	A
I^2t	* I^2t		Value for one cycle of surge current	1.25×10^5	A ² S
P _{GM}	Peak Gate Power Dissipation			10	W
P _{G(AV)}	Average Gate Power Dissipation			3	W
I _{FGM}	Peak Gate Current			3	A
V _{FGM}	Peak Gate Voltage (Forward)			10	V
V _{RGM}	Peak Gate Voltage (Reverse)			5	V
di/dt	Critical Rate of Rise of On-State Current		I _G =100mA, T _j =25 °C, V _D = $\frac{1}{2}$ V _{DRM} , dI _G /dt =0.1A/μs	200	A/μs
V _{ISO}	*Isolation Breakdown Voltage (R.M.S.)		A.C. 1 minute	2500	V
T _j	*Operating Junction Temperature			-40~+125	°C
T _{stg}	*Storage Temperature			-40~+125	°C
	Mounting Torque	Mounting (M5)	Recommended 1.5~2.5 (15~25)	2.7 (28)	N・m (kgf・cm)
		Terminal (M8)	Recommended 8.8~10 (90~105)	11 (115)	
	Mass			510	g

Electrical Characteristics

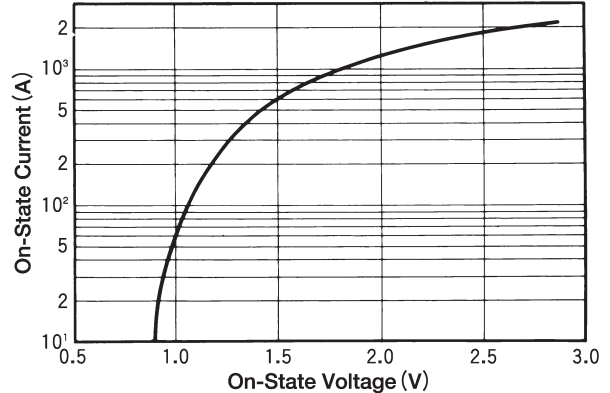
Symbol	Item	Conditions	Ratings	Unit
I _{DRM}	Repetitive Peak Off-State Current, max.	at V _{DRM} , single phase, half wave, $T_j = 125^\circ\text{C}$	50	mA
I _{RRM}	*Repetitive Peak Reverse Current, max.	at V _{DRM} , single phase, half wave, $T_j = 125^\circ\text{C}$	50	mA
V _{TM}	*Peak On-State Voltage, max.	On-State Current 500A, $T_j = 25^\circ\text{C}$ Inst. measurement	1.42	V
I _{GT} /V _{GT}	Gate Trigger Current/Voltage, max.	$T_j = 25^\circ\text{C}$, $I_T = 1\text{A}$, $V_D = 6\text{V}$	100/3	mA/V
V _{GD}	Non-Trigger Gate, Voltage. min.	$T_j = 125^\circ\text{C}$, $V_D = 1/2 V_{DRM}$	0.25	V
t _{gt}	Turn On Time, max.	$I_T = 160\text{A}$, $I_G = 100\text{mA}$, $T_j = 25^\circ\text{C}$, $V_D = 1/2 V_{DRM}$, $dI_G/dt = 0.1\text{A}/\mu\text{s}$	10	μ s
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_j = 125^\circ\text{C}$, $V_D = 2/3 V_{DRM}$, Exponential wave.	500	V/ μ s
I _H	Holding Current, typ.	$T_j = 25^\circ\text{C}$	50	mA
I _L	Latching Current, typ.	$T_j = 25^\circ\text{C}$	100	mA
R _{th(j-c)}	*Thermal Impedance, max.	Junction to case	0.18	°C/W

* mark : Thyristor and Diode part. No mark : Thyristor part

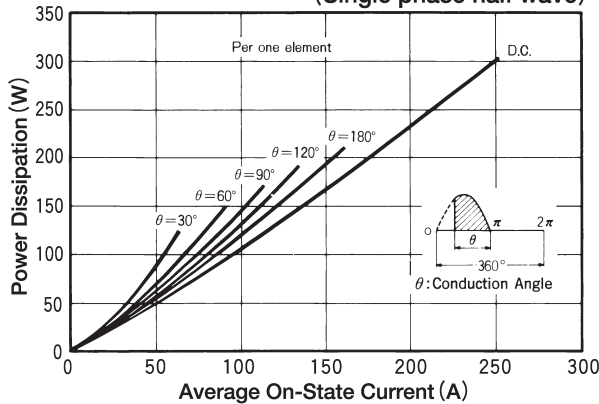
Gate Characteristics



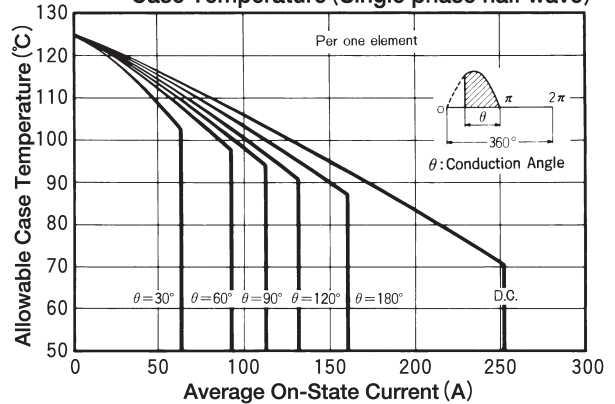
On-State Voltage max



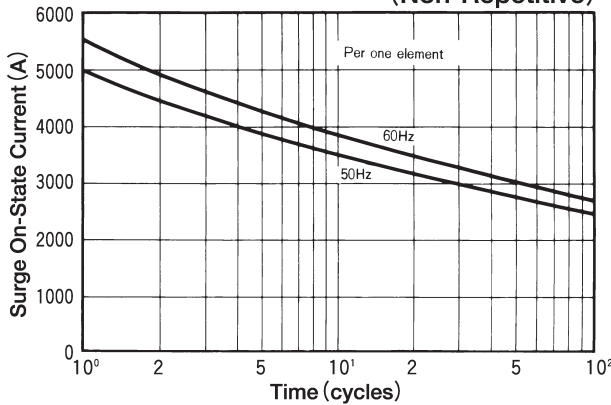
Average On-State Current Vs Power Dissipation (Single phase half wave)



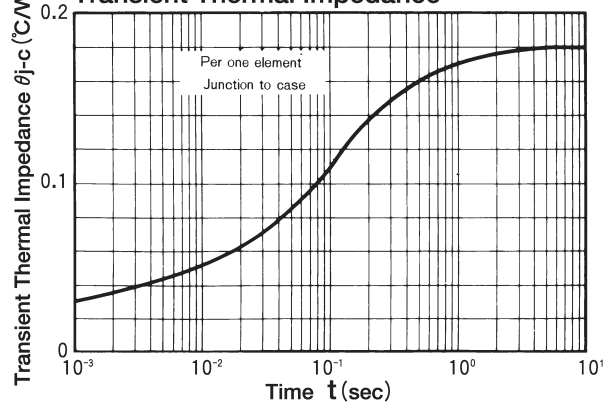
Average On-State Current Vs Maximum Allowable Case Temperature (Single phase half wave)



Surge On-State Current Rating (Non-Repetitive)

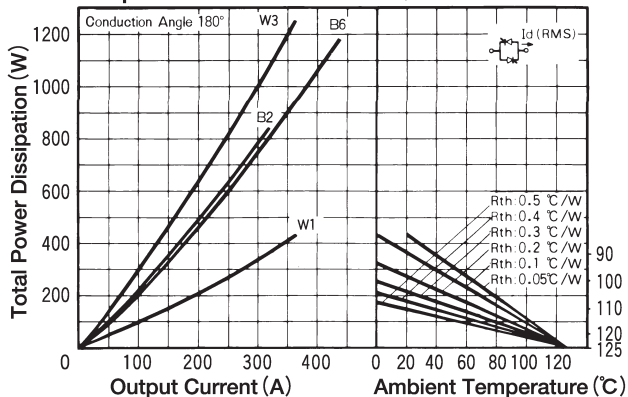


Transient Thermal Impedance

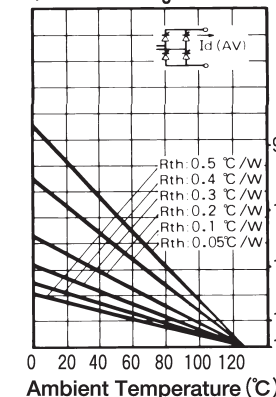


Output Current

W1; Bidirectional connection



B2; Two Pulse bridge connection



B6; Six pulse bridge connection W3; Three phase bidirectional connection

